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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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COMMENTS OF THE CORPORATION FOR EDUCATION NETWORK INITIATIVES IN CALIFORNIA (CENIC) TO THE RULING ORDERING ADDITIONAL COMMENTS AS PART OF THE MIDDLE-MILE DATA COLLECTION

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I. Introduction

The Corporation for Education Network Initiatives in California ("CENIC") respectfully submits these comments in the California Public Utilities Commission's ("Commission" or "CPUC") Administrative Law Judge's email ruling on September 9, 2021, ordering additional comments as part of the middle-mile data collection related to the middle-mile network. This email ruling seeks additional input on issues raised during the prior round of comments following the August 6, 2021, Assigned Commissioner Ruling. SB 156 is a historic measure to implement the state's largest investment in broadband to date, which included the addition of Government Code Section 11549.53(f) that outlines the solicitation topics for public comment. Given the tight

timelines in SB 156, we encourage the Commission to keep a keen focus on the issues prioritized in law. Further, CENIC offers the following points for consideration.

II. Discussion

A. Open Access and Middle-Mile Network Services for ISPs

As noted in the email ruling, the statute mandates that the Commission take into consideration aspects of the new middle-mile network that would increase the attractiveness and usefulness for commercial Internet Service Providers ("ISPs"). Given this framing, CENIC would encourage the Commission to avoid any desire to institute regulatory constraints that could have a chilling or delaying effect on the program prior to it getting off the ground. Further, CENIC believes that the statute already provides sufficient controls for the California Department of Technology ("CDT"), and therefore the Third-Party Administrator ("TPA"), to contractually enforce and achieve the protections for attractiveness and usefulness that the Commission may otherwise attempt through a duplicative regulatory construct. These contractual protections, based on a legislative mandate for open access, will be more advantageous and offer quicker routes to achieving the Legislature's intended goals with the passage of the statute.

The Third-Party Administrator chosen to develop and operate the middle-mile network already has considerable experience in dealing with network management, responsiveness to network events and outages, provisioning service calls and requests that will be necessary from time to time, as well as emergency response capabilities for events such as fiber cuts or wildfire that could occur at all hours of the day or night. In terms of the big picture, the reliability and physical route diversity of a network supports its ability to serve communities. Network performance and integrity can also be bolstered through the use of middle-mile network

exchange points, which when placed in appropriate regional locations throughout the state will enhance Internet performance for local, last-mile, end-users by keeping locally originated Internet traffic local (i.e. between a local network source and a local network destination). In addition, the caching of popular content, whether local or global in nature, that can be provided within a nearby regional, middle-mile network exchange is distinctly value-added for local ISPs and their end-user customers. And further, regionally-placed, middle-mile network exchanges will also enable local ISPs to reduce their operating costs by giving them a nearby regional, middle-mile on-ramp to the Internet, rather than having to pay for expensive backhaul circuits to distant locations in Los Angeles or the Bay Area where, currently, the major Internet exchange points are located. Based on the foregoing, distributed, regionalized exchange points will provide important service enhancements for both local end-users and local ISPs and are an essential integral part of the middle-mile network.

The examples noted above will significantly enhance the performance and reliability of a broadband network and are therefore critical for inclusion in what is deemed to be the middle-mile network. Proper planning and response considerations will need to be addressed by CDT and the Third-Party Administrator, and ultimately, how all these services will be paid for. The robustness and sustainability of the network must be a key consideration. Eventually, the one-time capital funds will become exhausted; yet, operational, maintenance, and refresh expenses will remain and be ongoing in nature. Another important factor for the middle-mile network to be successful will be for it to avoid, as much as possible, physically over-building on Caltrans (or other right-of-way) where other network providers already have infrastructure. Quite simply, the greatest resiliency for California communities intended to be served under SB 156 will be achieved by creating as many redundant and physically diverse network routes as possible for the

middle-mile network. Nonetheless, there may be cases where outdated fiber, capacity exhaustion, aerial installations in high fire-threat areas, or non-resilient connectivity can provide the justification and overall public benefit for new middle-mile fiber builds along a previously built corridor. Prioritization of investments will need to be made given the limitations of funding.

As such, CENIC strongly believes that a middle-mile network that is the most resilient is one that leverages and applies the different types of network infrastructure deployments available – in plain terms, "borrow, buy or build." On the current CPUC map of potential middle-mile locations, the Commission has already embraced the concept of "borrow," which takes advantage of other previously funded open-access, middle-mile initiatives and integrating them into the state's middle-mile efforts such as Digital 395. Second, the "buy" concept could entail either the purchase and ownership of optical fiber for the state, or ownership of long-term dark (i.e. unused and not terminated) fiber under IRUs ("Indefeasible Rights of Use") from an entity with suitable assets along the prioritized middle-mile locations. There are entities in the wholesale market, along many major routes in California, that have significant amounts of fiber and/or multiple amounts of unused conduit capacity through which new fiber could simply be "pulled" in order to place additional middle-mile network infrastructure. It is important to also consider as part of the "buy" concept the newer "spectrum-sharing" models - a strategy that allows multiple customers to utilize the same physical fiber to create individual networks securely and independently. This spectrum-sharing approach distributes both the Capital Expenditures and Operating Expenditures among the users of the fiber, based on shared amounts of usage. In addition, and as noted in our prior comments, Dense Wavelength-Division Multiplexing ("DWDM")-as-a-Service could also be applied under the "buy" category. DWDM

technology is typically deployed for network backbone or interconnect purposes (to/from network traffic aggregation exchanges or "meet-me" points where last-mile providers handoff their traffic to/from a middle-mile provider). Finally, with the "build" approach, as its name implies the building of new optical fiber, typically involves new conduit and optical fiber placed underground within a dirt trench on government-owned right-of-way. The build approach can also produce aerial optical fiber plant, which is attached to existing utility poles as a new-build option where underground trenching is impractical or infeasible.

B. Middle Mile for Consumers

Historically, looking at prior middle-mile networks that have been built in California with federal and/or state funds (Digital 395, CVIN, and Central Coast Connected), a central theme has been that they all involved connecting anchor institutions as key tenants to the success of the build. The latter two (CVIN and Central Coast Connected) worked closely with CENIC for the coordination of the educational anchor institutions connectivity as part of the projects. In these two projects, we partnered with the telecommunications provider to ensure that the connections for educational institutions still afforded last-mile providers the business case to make additional investments necessary to bring services to the end users. The middle-mile network must ensure that residences and businesses will still be served by last-mile providers and should not connect all anchor institutions. A closer examination of the previously funded middle-mile networks could be informative to the Commission.

There can be a delicate balance between serving the anchors and creating the business case for last-mile builds. Anchor institutions get their name because they serve as the "tenant" or "anchor store," similar to the analogous concept of a mall or shopping center. Without the "bigger" brands, it can be harder for the mall to be built as the providers of financing for these

typically require the commitments of anchor stores to occupy space. Further, for the small shops and businesses to be successful and generate enough revenue to pay their rents, which sustain the maintenance and upkeep of the mall or shopping center, they need the foot traffic brought in from the anchor stores. Should the middle-mile network scoop up all of the anchor institutions, it will become extremely challenging for the last-mile projects to be sustainable, let alone form in the first place.

C. Other States

The email ruling listed Kentucky as one of the states that serves as a potential example of other statewide open-access networks. However, from our understanding of the project through conversations with key stakeholders in Kentucky, it should be viewed as an example of what not to do. Similarly, Kentucky is constructing over 3,000 miles of high-speed, high-capacity fiber-optic cable in every county with a focus of only connecting government sites. The project is behind schedule and over budget – while a conservative estimate by their state auditor indicates it will be nearly $1.5 billion over budget in the end;[1] nearly 20% of households still lack a subscription for high-speed Internet.[2] From CENIC's perspective, the lack of focus on coordinating the last-mile infrastructure has undermined the success of the project. Another similar example was Colorado's EAGLENet, which took the mantra of "serve every school district" irrespective of whether there was an issue with service quality or whether they already had broadband. This network also tried to be all things to all schools. In a recent article outlining the challenges and hurdles of Colorado's attempt, one line stood out, "The goal of the fiber is not for the government to make a profit. It's to enable private companies to create

[1] *See* https://www.propublica.org/article/matt-bevin-kentucky-information-highway-high-speed-internet, Accessed September 30, 2021

[2] *See* https://www.courier-journal.com/story/news/local/2021/02/19/kentuckywired-broadband-networks-exclusive-provider-accelecom/4494763001/ Accessed September 30, 2021

sustainable businesses in areas that are otherwise too expensive to do so."[3] While California is not Kentucky nor Colorado, these examples help to shape the conversation by affording the opportunity to learn from others' mistakes.

D. Other Issues

As elevated earlier in these comments, the operating expenditures, network management plans, and technology refresh needs are other critical components to the ongoing success of the middle-mile network. If there are no revenues or users of the middle-mile network, then there will be no resources to sustain, maintain, and upgrade the network. These factors need to be fully considered when putting together all of the pieces of the network. Further, CENIC expects that a series of roundtables, led by the TPA, with specific interest groups would be a very productive format in which to examine and work through these issues, and others, that have been raised during the public comment process.

III. Conclusion

CENIC is grateful to have the opportunity to continue providing additional thought partnership in this proceeding to see the success of the statewide open-access middle-mile broadband network. CENIC remains committed to achieving broadband digital equity for all Californians and ensuring robust broadband connectivity can be achieved for CENIC members and their patrons, students, staff, and faculty.

[3] *See* https://forethought.net/why-did-eagle-net-fail-all-parts-in-one-file/ Accessed September 30, 2021

Respectfully submitted,

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